



Problem of the Week

Problem C

Six Zeros

The product of the first seven positive integers is equal to

$$7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$$

Mathematicians will write this product as $7!$. This is read as “7 factorial”. So, $7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$.

This factorial notation can be used with any positive integer. For example, $11! = 11 \times 10 \times 9 \times \cdots \times 3 \times 2 \times 1 = 39\,916\,800$. The three dots “ \cdots ” represent the product of the integers between 9 and 3.

In general, for a positive integer n , $n!$ is equal to the product of the positive integers from 1 to n .

Find the smallest positive integer n such that $n!$ ends in exactly six zeros.

... 000 000